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| APPLICATION NO.                                                                                     | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/806,209                                                                                          | 03/23/2004  | Shuichi Tsukada      | OGW-0311            | 1922             |
| 24978 7590 06/30/2008<br>GREER, BURNS & CRAIN<br>300 S WACKER DR<br>25TH FLOOR<br>CHICAGO, IL 60606 |             |                      |                     |                  |
| EXAMINER<br>FISCHER, JUSTIN R                                                                       |             |                      |                     |                  |
| ART UNIT                                                                                            |             | PAPER NUMBER         |                     |                  |
| 1791                                                                                                |             |                      |                     |                  |
| MAIL DATE                                                                                           |             | DELIVERY MODE        |                     |                  |
| 06/30/2008                                                                                          |             | PAPER                |                     |                  |

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* SHUICHI TSUKADA, HIROSHI YAMAUCHI, and  
YASUJI AKIYOSHI

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Appeal 2008-1021  
Application 10/806,209  
Technology Center 1700

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Decided: June 30, 2008

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Before PETER F. KRATZ, CATHERINE Q. TIMM, and  
ROMULO H. DELMENDO, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of all pending claims (claims 1, 3, 4, 6, and 7). (Final Office Action entered August 28, 2006). We have jurisdiction under 35 U.S.C. § 6(b).

Appellants' invention relates to a pneumatic tire and its manufacture. The tire has a "carcass layer [that] is arranged between a pair of left and right bead portions and an inner liner layer [that] is provided on an inner side of the carcass layer." (Spec. ¶ 0006, Fig. 1). The tire includes "volume adjusting members [that] are intermittently arranged between the carcass layer and the inner layer in the bead portions in a tire circumferential direction so as to change a sectional shape of a closed space formed between the tire and a wheel in the tire circumferential direction." (*Id.* ¶ 0006, Fig. 1).

Representative claims 1 and 4 read as follows:

1. A pneumatic tire, comprising:

a carcass layer arranged between a pair of left and right bead portions; and

an inner liner layer provided on an inner side of the carcass layer,

wherein volume adjusting members are intermittently arranged between the carcass layer and the inner layer in the bead portions in a tire circumferential direction so as to change a sectional shape of a closed space formed between the tire and a wheel in the tire circumferential directions, and

wherein the volume adjusting members are arranged at equal intervals in the tire circumferential direction.

4. A method for manufacturing a pneumatic tire, comprising the steps of:

intermittently crimping volume adjusting members on both side sections of a sheet inner liner material in a longitudinal direction thereof beforehand;

winding the inner liner material on an outer peripheral side of a forming drum;

winding a sheet carcass material on an outer peripheral side of the inner liner material;

forming an unvulcanized tire containing the inner liner material and the carcass material; and

vulcanizing the unvulcanized tire,

wherein the volume adjusting members are intermittently arranged in a tire circumferential direction between the inner liner material and the carcass material.

The prior art references relied upon by the Examiner to reject the claims on appeal are:

|          |                 |               |
|----------|-----------------|---------------|
| Martin   | US 4,034,792    | Jul. 12, 1977 |
| McDonald | US 4,343,342    | Aug. 10, 1982 |
| Sakamoto | US 6,418,993 B1 | Jul. 16, 2002 |
| Hendrie  | US 6,536,368 B2 | Mar. 25, 2003 |
| Yamada   | JP 02-106330    | Apr. 18, 1990 |
| Kajiware | JP 03-193510    | Aug. 23, 1991 |
| Numata   | JP 11-170824    | Jun. 29, 1999 |
| Akiyoshi | JP 13-113902    | Apr. 24, 2001 |

The following rejections are before us for review:

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable in view of Kajiware, Akiyoshi, Martin, McDonald, Sakamoto,

and Hendrie, or Numata, Akiyoshi, Martin, McDonald, Sakamoto, and Hendrie.

Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable in view of Kajiwara, Numata, Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada.

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Kajiwara, Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada, or Numata, Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada.

We AFFIRM IN PART.

#### ISSUES

Have Appellants shown reversible error in the Examiner's determination that claims 1, 3, 4, 6, and 7 would have been obvious to one of ordinary skill in the art over the applied prior art?

#### FINDINGS OF FACT

1. Appellants' Fig. 1 is reproduced below.

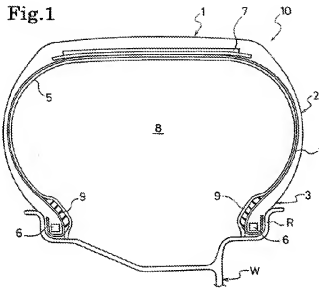


Fig. 1 depicts Appellants' pneumatic tire 10 having tread portion 1, sidewall portion 2, and bead portion 3, where volume adjusting members 9 are arranged between inner liner layer 5 and carcass layer 4, and located in the bead portions 3 of the tire, which is secured to a rim R of a wheel W. (Spec. ¶ 0015-0016).

2. Appellants' inventive tire has volume adjusting members "intermittently arranged . . . at equal intervals in the tire circumferential direction." (Spec. ¶ 0016).

3. Kajiware and Numata each discloses "pneumatic tire constructions in which a rubber member or 'volume adjusting member' is arranged between an inner liner and a carcass layer in the bead regions," and that "the inclusion of rubber member reduces the volume of the tire cavity by altering the contour of tire inner surface (change in section shape)." (Uncontested by Appellants, App. Br. 7, l. 14 – 8, l. 14; Reply Br. 2-3; Ans. 4, l. 17 through 5, l. 2; Kajiware, Figs. 1 and 2; Numata, Figs 1, 2, and 5).

4. Akiyoshi teaches decreasing road noise from wheels “by changing the cross-sectional shape of the closed space in the circumferential orientation so that the air column resonating frequency of the space enclosed by the wheel and tire changes with rotation of the wheel.” (§ 0006).
5. Akiyoshi discloses a tire with multiple bulkheads intermittently arranged around the circumference of the tire, “so the air column resonating frequency can be changed to reduce noise with rotation of [the] wheel.” (§ 0019; Figs. 9a, 9b).
6. Akiyoshi discloses a tire “wherein 2 bulkheads having approximately 1/4 the length of the entire circumferential length *on the tire inner surface . . . are equally spaced.*” (Emphasis added, § 0020, Figs. 9a, 9b).
7. Kajiware discloses a tire structure for decreasing road noise from wheels by “installing a rubber reinforcing layer . . . along the inner surface of a carcass body part in a bead part . . . [to] lower[] the vibration transmission coefficient through the reduction of the carcass tension.” (P. 6, ll. 1-5; Figs. 1 and 2).

## PRINCIPLES OF LAW

A claimed invention is unpatentable if the differences between it and the prior art are “such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2000).

“Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved.

Against this background, the obviousness or nonobviousness of the subject matter is determined.” *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1734 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966)).

## ANALYSIS

*The Obviousness Rejections of Claims 1 and 3 in View of Kajiwara, Akiyoshi, Martin, McDonald, Sakamoto, and Hendrie, or Numata, Akiyoshi, Martin, McDonald, Sakamoto, and Hendrie.*

Appellants state that claims 1 and 3 stand or fall together, and submit specific arguments with respect to independent claim 1. (App. Br. 7, l. 4 through 12, l. 15). Accordingly, we select claim 1 as representative and confine our discussion to this claim. 37 C.F.R. § 41.37(c)(1)(vii) (2006).

Appellants do not contest the Examiner’s findings that Kajiwara and Numata each disclose all the limitations of Appellants’ claimed tire except for the reinforcement layer of volume adjusting members intermittently spaced at equal intervals in a tire circumference direction. (FF 1, 2, 3; App. Br. 7, l. 14 – 8, l. 14; Reply Br. 2-3). Rather, Appellants argue that none of Akiyoshi, Martin, McDonald, Sakamoto, and Hendrie teaches the missing claim limitations. (App. Br. 7, ll. 14 through 10).

Appellants’ arguments fail because Akiyoshi explicitly teaches the missing limitations. The Examiner recognizes this, asserting that Akiyoshi’s Figs. 1-10 show tire layers and components in either a continuous or discontinuous manner (Ans. 5, ll. 4-6, FF 4, 5), and that Akiyoshi provides examples of equal spacing of discontinuous components. (*Id.* 6, ll. 3-5; FF 6). Also, the Examiner asserts that the use of discontinuous tire layers “is

extremely well-known and conventional in the tire industry,” and that “[i]n such instances, sufficient reinforcement or effect on a given property is obtained and tire weight is minimized.” (*Id.* 5, ll. 8-11). Furthermore, the Examiner states that “Akiyoshi is directed to an extremely similar tire construction [to that disclosed in Kajiwara] in which a ‘volume adjusting member’ . . . is able to provide the desired reduction in noise (reduction in columnar resonance), which is the same benefit desired in the tire of Kajiwara.” (*Id.* 5, ll. 17-21). Based on these findings, the Examiner concludes “it [would have been] obvious to incorporate such a design in either Kajiwara or Numata depending on the desired distribution of the reinforcement.” (*Id.* 5, ll. 12-13). We agree with the Examiner’s determinations.

Appellants’ arguments that drawings “*may not* be relied on to show particular sizes *if the specification is completely silent on the issue*,” and that “arguments based on the measurement of a drawing *are of little value* absent any written description in the specification of the quantitative values allegedly shown within the drawings,” (App. Br. 8, l. 19 through 9, l. 3), are unpersuasive in light of the clear written description by Akiyoshi to use “volume adjustment members” *intermittently arranged and equally spaced*. (FF 5, 6).

Appellants also argue that “the fact that the claimed invention is within the capabilities of one of ordinary skill in the art *is not sufficient* by itself to establish *prima facie* obviousness,” and that because “references can be combined or modified *is not sufficient* to establish *prima facie* obviousness.” (App. Br. 11, ll. 6-8). Appellants contend that “the noise reducing system according to *Akiyoshi* and the system according to

*Kajiwara* completely differ from each other, so that it is unreasonable to combine *Akiyoshi* and *Kajiwara* together.” (*Id.* 11, ll. 21-23). These arguments are unpersuasive.

Akiyoshi addresses decreasing road noise from wheels “by changing the cross-sectional shape of the closed space in the circumferential orientation so that the air column resonating frequency of the space enclosed by the wheel and tire changes with rotation of the wheel.” (FF 4). *Kajiwara* is directed to decreasing road noise from wheels due to vibrations transmitted to the wheel rim through the tire carcass (FF 7). Combining the teachings of Akiyoshi and *Kajiwara* would have been obvious to one of ordinary skill in the art to further the prior art objective of reducing road noise in tires. Employing different noise reducing techniques addresses different aspects of road noise, with each technique employed in the combination performing its same function as when used alone. Appellants have not relied on any persuasive evidence or reasoning to show that the different noise reducing systems could not be used together to perform their respective functions. Furthermore, Appellants have not shown that combining the prior art teachings would have been beyond the skill of one of ordinary skill in the art. For these reasons, Appellants have not shown that the Examiner erred in determining the teachings of the prior art would have been obvious to one of ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1740 (2007) (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”).

Moreover, Appellants’ contentions that the Examiner failed to provide evidence that a person having ordinary skill in the art would not have

expected potential deficiencies upon combining the teachings of the prior art are without merit (Reply Br. 2, l. 21 through 3, l. 4). Akiyoshi's teachings of successfully reducing road noise with intermittently arranged members, coupled with the similarities in terms of tire structure between Akiyoshi and Kajiwara, provide the necessary factual basis to demonstrate a reasonable expectation of success in combining the teachings of the prior art, which is all that is required under 35 U.S.C. § 103(a). *In re O'Farrell*, 853 F.2d 894, 904 (Fed. Cir. 1988) ("For obviousness under §103, all that is required is a reasonable expectation of success.").

Having determined that the Examiner has established a *prima facie* case of obviousness, we now look to whether Appellants have provided sufficient objective evidence of nonobviousness to rebut the Examiner's rejections. Appellants argue that their Specification shows experimental data that "provide a showing of unexpected results." (App. Br. 12, ll. 1-2; Table 1). The Examiner asserts that the experimental data did not compare the closest prior art (Ans. 8, ll. 10-22). Appellants argue, however, that "the closest prior art is a hypothetical device of unknown construction. For this reason, it is unreasonable for the examiner to expect such experimental results, and it is unreasonable for the examiner to completely reject applicant's evidence of unexpected results on this basis." (Reply Br. 3, ll. 7-10).

Proof of unexpected results requires testing the claimed invention against the closest prior art to obtain evidence, commensurate with the scope of the claims, showing the claimed invention exhibits test results that truly are unexpected. *See In re Burckel*, 592 F.2d 1175, 1179 (CCPA 1979), *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005). Here, Appellants compared

several pneumatic tires: 1) a reference tire; 2) a tire having volume adjusting members “intermittently stuck to a tire inner surface *in a tread portion* in a tire circumferential direction”; 3) a tire having volume adjusting members “intermittently stuck to a tire inner surface *in a bead portion* in a tire circumferential direction”; and 4) an “embodiment” tire “in which volume adjusting members are intermittently embedded between a carcass layer and an inner liner layer in bead portions in a tire circumferential direction.” (Emphasis added, Spec. ¶ 0024).

These tests compare the effect of intermittently arranged volume adjusting members on the tire inner surface *at tread or bead portions* with intermittently arranged members *inside the bead portion*. Thus, while comparatively testing the location of intermittently arranged volume adjusting members in a tire, Appellants did not comparatively test the effect of intermittent spacing. That is, an arrangement of *continuous* “volume adjusting members” *inside the bead portion*, as shown in Kajiwarra and Numata, were not comparatively tested against *intermittently spaced* members *inside the bead portion* (i.e., the “embodiment” example). Appellants’ testing should have compared this closest prior art as well as their conventional examples. In addition, Appellants’ testing is not commensurate with the scope of the claims. Appellants do not submit any test evidence regarding different numbers of volume adjusting members and different values of equal spacing between the members; variations that are encompassed by the claims. Finally, even if we assume that Appellants compared the closest prior art commensurate with the scope of the claims, they have not persuasively explained how the reported test results are truly “unexpected.” Comparative test results showing a benefit of Appellants’

invention do not establish that the results were “unexpected.” For these reasons, Appellants fail to satisfy their burden to show unexpected results from the claimed invention. Accordingly, the Examiner’s prima facie case of obviousness is not refuted.

The claim rejections are affirmed in view of Kajiwara and Akiyoshi. We need not further discuss Numata, Martin, McDonald, Sakamoto, and Hendrie for this ground of rejection because such a discussion is unnecessary to decide the issue raised on appeal.

*The Obviousness Rejections of Claims 4, 6, and 7 in View of Kajiwara, Numata, Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada.*

Appellants state that claims 4 and 6 stand or fall together, and submit specific arguments with respect to independent claim 4. (App. Br. 12, l. 16 through 18, l. 7). Accordingly, we select claim 4 as representative of this claim group and confine our discussion to this claim. 37 C.F.R. § 41.37(c)(1)(vii) (2006).

The Examiner asserts that although “Kajiwara and Numata are silent as to the specific tire manufacturing method . . . the claimed method is consistent with the common methods of forming tires, as shown for example by Yamada.” (Ans. 6, ll. 15-17). The Examiner contends that:

Yamada recognizes the placement of a reinforcing layer (analogous to rubber members) on each side of a base rubber sheet (analogous to inner liner), subsequently winding the assembly on a drum, and winding any additional layers and finally curing/vulcanizing the tire. It is emphasized that such a winding technique around a drum is extremely well known and extensively used in the manufacture of tires.

(Ans. 6, l. 18 through 7, l. 2).

Appellants argue that the Examiner “*admits* that Kajiwara and Numata are *silent* as to the specific tire manufacturing method,” (App. Br. 13, ll. 11-12), and that Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada all fail to disclose the claimed “step of intermittently crimping volume adjusting members on both side sections of a sheet of inner liner material in a longitudinal direction thereof beforehand.” (Claim 4; App. Br. 13, l. 11 through 18 l. 7).

We agree with Appellants. The Examiner has not sufficiently established that the prior art discloses or suggests a “crimping” step to attach multiple volume adjusting members to an inner liner. The Examiner’s assertion that “the disclosure of Yamada to ‘integrally apply’ the rubber member to the carcass prior to winding is seen to constitute the claimed crimping as the original disclosure fails to define the crimping step in a manner that defines over the technique of Yamada” (Ans. 9, ll. 16-18) is not supported by evidence. The term “crimping,” as recited in the tire manufacture method claims, conveys its ordinary meaning that is not lost when Appellants’ do not define the term in their disclosure. The Examiner has not provided evidence to show that one of ordinary skill in the art would understand “integrally applied,” as used in the prior art, to mean the same as “crimping,” as used in the context of the invention. Accordingly, the Examiner’s rejections of claims 4 and 6 are reversed.

*The Obviousness Rejection of Claim 7 in View of Kajiwara, Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada, or Numata, Akiyoshi, Martin, McDonald, Sakamoto, Hendrie, and Yamada.*

Appellants do not submit specific arguments with respect to claim 7, but rely on arguments discussed above. Claim 7 is dependent upon claim 4 and therefore includes the claimed step of “intermittently crimping volume adjusting members on both side sections of a sheet of inner liner material in a longitudinal direction thereof beforehand.”

For the same reasons as discussed above with respect to claim 4, we reverse the Examiner’s rejection of this dependent claim 7.

### CONCLUSION

Appellants have failed to show that the Examiner reversibly erred in finding that claims 1 and 3 are unpatentable over Kajiware, Akiyoshi, Martin, McDonald, Sakamoto, and Hendrie, or over Numata, Akiyoshi, Martin, McDonald, Sakamoto, and Hendrie.

On this record, the Examiner has not established a prima facie case of obviousness of claims 4, 6, and 7. Accordingly, the Examiner’s rejections of these claims are reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

Appeal 2008-1021  
Application 10/806,209

PL initials  
sld

GREER, BURNS & CRAIN  
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